ANALISA PROBABLE MAXIMUM FLOOD (PMF) TERHADAP KAPASITAS TAMPUNGAN AIR WADUK JATIGEDE

Yuli Yulia Citra, Mardiani[1], Dedi Purwanto[2]

Program Studi Teknik Sipil-S1, Fakultas Pendidikan Teknologi Dan Kejuruan, Universitas Pendidikan Indonesia

Email: yuliacitra03@gmail.com

ABSTRAK

Ada banyak manfaat bendungan, contohnya PLTA dan irigasi. Namun, bendungan juga dapat menimbulkan bahaya jika tidak dioperasikan dengan baik, termasuk kemungkinan terjadinya *overtopping* akibat *Probable Maximum Flood* (PMF). Agar terhindar dari bahaya *overtopping* yang disebabkan oleh debit PMF perlu dilakukan rekayasa terhadap debit *release* yang keluar melalui pintu *spillway* pada saat kondisi awal muka air waduk di elevasi tertentu. Penelitian ini melakukan rekayasa genangan waduk dengan mensimulasikan *release* melalui pintu *spillway*. Analisa memperhitungkan kondisi awal muka air waduk di elevasi +247 (mercu *spillway*), elevasi +258,25 (*control water level*), dan elevasi +260 (muka air normal). Hasil penelitian menunjukan apabila terjadi debit PMF pada saat kondisi awal muka air waduk di elevasi +247 (mercu *spillway*), akan terjadi kenaikan muka air waduk mencapai elevasi +253,47 m. Penurunan muka air waduk dapat dilakukan dengan *release* melalui tiga pintu tinggi bukaan 1,1 m, debit *release* maksimum sebesar 319,5 m^3/det dan waktu yang diperlukan 7,4 hari. Pada awal muka air waduk di elevasi +258,25 (*control water level*), akan terjadi kenaikan muka air waduk mencapai elevasi +263,32 m. Penurunan muka air waduk dapat dilakukan dengan *release* melalui tiga pintu tinggi bukaan 0,83 m, debit *release* maksimum sebesar 399,7 m^3/det dan waktu yang diperlukan 16,8 hari. Kemudian, untuk awal muka air waduk di elevasi +260 (muka air normal), akan terjadi kenaikan muka air waduk mencapai elevasi +264,67 m. Penurunan muka air waduk dapat dilakukan dengan *release* melalui empat pintu terbuka tinggi bukaan 0,598 m, debit *release* maksimum sebesar 399,5 m^3/det dan waktu yang diperlukan 18,5 hari.

Kata Kunci: *probable maximum flood* (PMF), *overtopping*, *spillway*, *Release*.

THE ANALYSIS OF PROBABLE MAXIMUM FLOOD (PMF) TOWARDS THE CAPACITY OF JATIGEDE WATER RESERVOIR

Yuli Yulia Citra, Mardiani[1], Dedi Purwanto[2]

Department of Civil Engineering, Faculty of Technology and Vocational Education, Indonesia University of Education

Email: yuliacitra03@gmail.com

ABSTRACT

There are many benefits of dams, for example hydropower and irrigation. However, dams can also be dangerous if not operated properly, including the possibility of overtopping due to the Probable Maximum Flood (PMF). To avoid overtopping caused by PMF discharge, release through the spillway needs to be adjusted, on the initial conditions of water level at a certain elevation. The calculation was done by engineering pool of reservoir with simulation the release passing through the spillway gate. The analysis was performed on the initial conditions of water level at elevation +247 (crest spillway), elevation of +258.25 (control water level), and the elevation +260 (normal water level). The results showed that when the initial conditions of water level at elevation +247 (crest spillway), PMF discharge will raise the water level to the elevation of +253.47 m. Reservoir water level decreased to the initial elevation with the release through three gates height of 1.1 m, the maximum discharge of 319.5 m^3/sec and takes 7.4 days. When the initial conditions of water level at elevation +258,25 (control water level), PMF discharge will raise the water level to the elevation of +263,32 m. Reservoir water level decreased to the initial elevation with the release through three gates height of 0.83 m, the maximum discharge of 399.7 m^3/sec and takes 16.8 days. When the initial conditions of water level at elevation +260 (normal water level), PMF discharge will raise the water level to the elevation of +264,67 m. Reservoir water level decreased to the initial elevation with the release through four gates height of 0,598 m, the maximum discharge of 399,5 m^3/sec and takes 18,5 days.

Keywords: *probable maximum flood (PMF), overtopping, spillway, Release.*